

WHAT IS CLAIMED IS:

- 1 1. A starter comprising:
 - 2 a motor for generating a rotating force for an armature;
 - 3 a planetary reduction assembly for reducing rotation of said armature
 - 4 through a planetary gear;
 - 5 a power transmission device formed into a cylindrical configuration and
 - 6 integrated with a carrier made to support said planetary gear for transmitting
 - 7 rotation of said carrier;
 - 8 an output shaft whose motor-side end portion is spline-fitted in an inner
 - 9 circumference of said power transmission device so that said output shaft is
 - 10 movable by a predetermined quantity in its axial directions with respect to said
 - 11 power transmission device;
 - 12 a pinion shaft fitted through a pinion bearing over an outer circumferential
 - 13 surface of said output shaft to be rotatable;
 - 14 a pinion provided at an end portion of said pinion shaft on an opposite side
 - 15 to a motor to be rotated integrally with said pinion shaft;
 - 16 a one-way clutch for transmitting rotation of said output shaft to said
 - 17 pinion shaft; and
 - 18 a housing including a housing bearing located between said pinion and
 - 19 said one-way clutch to support said pinion shaft so that said pinion shaft is
 - 20 rotatable and slidable,
 - 21 said output shaft being made to be moved integrally with said pinion shaft
 - 22 and said one-way clutch in an opposite-of-motor side direction when an engine is
 - 23 placed into a cranking condition so that said pinion engages with a ring gear of
 - 24 said engine.
- 1 2. The starter according to claim 1, wherein, when said pinion shaft, together
- 2 with said output shaft, is moved in the opposite-of-motor direction up to a position
- 3 at which said pinion engages with said ring gear, a pinion-side end portion of said

4 pinion bearing protrudes toward a pinion side with respect to a pinion-side end
5 portion of said housing bearing.

1 3. The starter according to claim 1, wherein said pinion bearing includes a
2 first pinion bearing for supporting an opposite-of-motor side end portion of said
3 output shaft and a second pinion bearing located on a motor side with respect to
4 said first pinion bearing.

1 4. The starter according to claim 1, wherein said pinion bearing is made to
2 support a portion between an opposite-of-motor side end portion of said output
3 shaft and an inner diameter side of an inner portion constituting said one-way
4 clutch.

1 5. The starter according to claim 1, wherein said one-way clutch has a
2 cylindrical portion to cover an outer diameter portion of an opposite-of-motor end
3 portion of said power transmission device when said pinion is in a resting
4 condition.

1 6. The starter according to claim 1, wherein a motor-side end portion of said
2 output shaft, which has said spline, is recessed into a cylindrical configuration and
3 an end portion of a shaft of said armature is inserted through a bearing into the
4 interior of said cylindrical configuration.